Abstract

Agricultural research is aimed towards increasing the productivity and food quality at reduced expenditure and with increased profit. One of the main challenges of this approach is to equip farmers with adequate and affordable information and control technology; as for higher crop yields, they need advanced expert knowledge to take proper decisions during land preparation, sowing, fertilizer management, irrigation management, integrated pest management, storage etc. In an effort to provide a methodology for better assessment on the functional outcome of this research area, an online fuzzy logic based agricultural decision support system is developed and presented in this paper. The aim of this system is to assist farmers in taking proper decisions for having a better crop production with less cost, despite the adverse nature of the soil on their farming area. Our proposed system focuses on utilizing abundant surface ground water available at the end of the wet season while benefiting from timely access to shallow groundwater from the process of capillary rises so that the farmers can have a better crop yield with or even without the expensive irrigations. The experiment was carried out in the northern and southern (coastal areas) regions of Bangladesh. Fuzzy logic is used in this case to
A Fuzzy Logic based Agricultural Decision Support System for Assessment of Crop Yield Potential using Shallow Ground Water Table

handle uncertain or ambiguous data and knowledge of the input data. Experimental results presented in this paper also show that despite diverse climate nature, farmers can produce a hefty amount dry season crops in the coastal areas by utilizing shallow ground water, which was thought as impossible before. Though the experiment is carried out in Bangladesh only, if successfully implemented, this finding is believed to bring a groundbreaking agricultural advancements for the coastal area farmers in all over the world. Especially in the coastal areas of India, Myanmar, Nepal, Indonesia and Vietnam as their nature of the soil is almost same as Bangladesh.

References


Index Terms

Computer Science  Fuzzy Systems

Keywords

Agriculture, online Decision Support System, fuzzy Logic, flexible querying, shallow groundwater, Bangladesh